SKYWORKS®

DATA SHEET

PIN Diode Chips Supplied on Film Frame

Features

- Designed for high-performance switch and attenuator applications
- Preferred device for module applications
- PIN diodes supplied 100% tested, sawn, mounted on film frame
- Low cost
- Available lead (Pb)-free, RoHS-compliant, and Green

Description

The SMP series of PIN diodes is designed for high-volume switch applications from 10 MHz to beyond 2 GHz. The low current, low capacitance performance of these diodes makes the SMP series particularly suited for battery-operated circuits, power amplifier modules, VCO, T/R switches and other applications. The SMP1302-099 and SMP1304-099 parts are designed as low-distortion attenuators used in TV distribution and cellular base station applications.

NEW Skyworks Green products are lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.

Absolute Maximum Ratings

Characteristic	Value
Reverse voltage (V_R)	50 V
Power dissipation @ 25 °C at the base of the chip	250 mW
Storage temperature	-65 °C to +150 °C
Operating temperature	-65 °C to +150 °C
ESD human body model	Class 1 B

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: *Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.*

Electrical Specifications at 25 °C

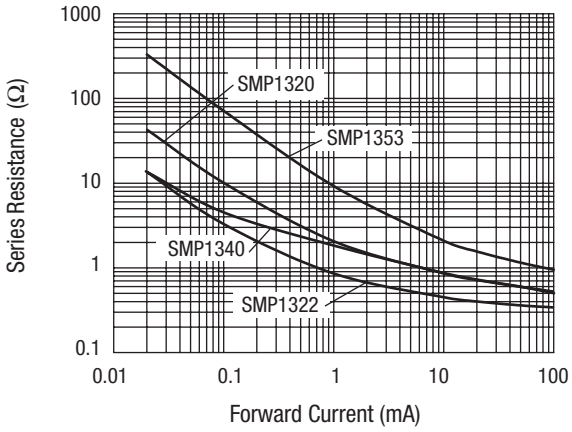
Part Number	Voltage Rating[1] (V)	Typ. C_J V_R = 0 V F = 1 MHz (pF)	Max. C_J V_R = 10 V F = 1 MHz (pF)	Typ. V_F @ I_F = 10 mA (mV)	Max. R_S I_F = 1 mA F = 100 MHz (Ω)	Max. R_S I_F = 10 mA F = 100 MHz (Ω)	Typical Carrier Lifetime I_F = 10 mA (nsec)
Switching Applications							
SMP1320-099	50	0.23	0.175	850	2 Typ.	0.9	400
SMP1322-099	50	1.1	0.85	825	1.5	0.45 Typ.	400
SMP1340-099	50	0.2	0.15	880	1.7 Typ.	1.2	100
SMP1353-099	100	0.35	0.15	825	15	2.8	1000
Attenuator Applications							
SMP1302-099	200	0.27	0.15 @ 30 V	800	20	3	700
SMP1304-099	200	0.18	0.15 @ 30 V	800	50	7	1000

The above PIN diode chips are processed on 100 mm silicon wafers, 100% DC tested, sawn and shipped on 6" film frame hoops.
Electrical rejects are identified with black ink.
1. It is not recommended to drive a PIN diode into avalanche breakdown. Permanent damage to the diode may occur.

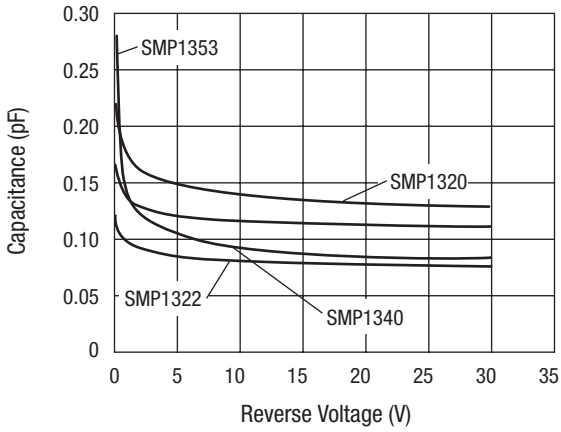
Chip Dimensions

Part Number	Quantity of Good Diodes Per Wafer Bonding Pad		Chip Size Nominal (In.)	Chip Height Nominal (In.)	Nominal (In.)
	Min.	Nom.			
SMP1320-099	40,000	46,000	0.003 ± 0.0003	0.0135 ± 0.001	0.0055 ± 0.0005
SMP1322-099	40,000	46,000	0.0075 ± 0.0003	0.0135 ± 0.001	0.0055 ± 0.0005
SMP1340-099	65,000	72,000	0.003 ± 0.0003	0.011 ± 0.001	0.0055 ± 0.0005
SMP1353-099	65,000	72,000	0.008 ± 0.0005	0.011 ± 0.001	0.0055 ± 0.0005
SMP1302-099	40,000	46,000	0.0085 ± 0.0005	0.0135 ± 0.001	0.0055 ± 0.0005
SMP1304-099	40,000	46,000	0.0085 ± 0.0005	0.0135 ± 0.001	0.01 ± 0.001

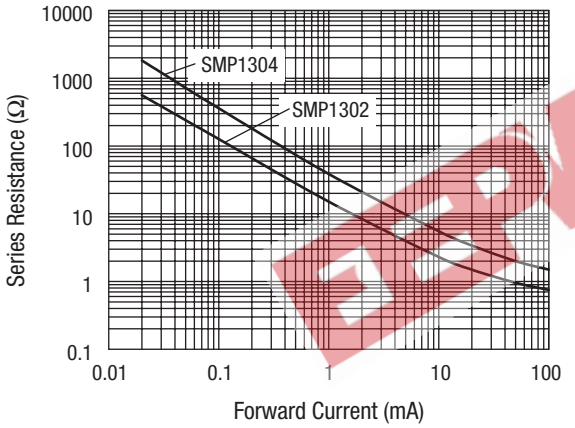
Typical Performance Data at 25 °C



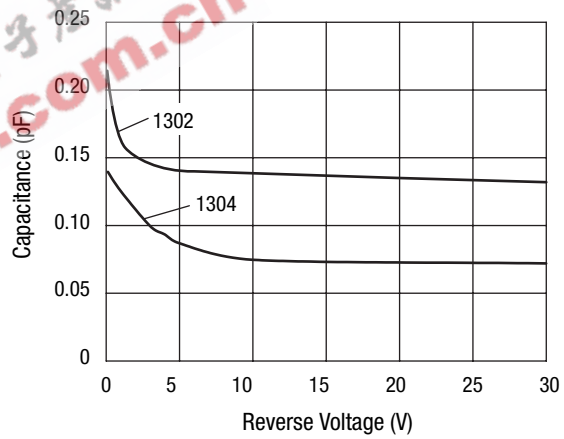
Series Resistance vs. Forward Current @ 100 MHz



Capacitance vs. Reverse Voltage

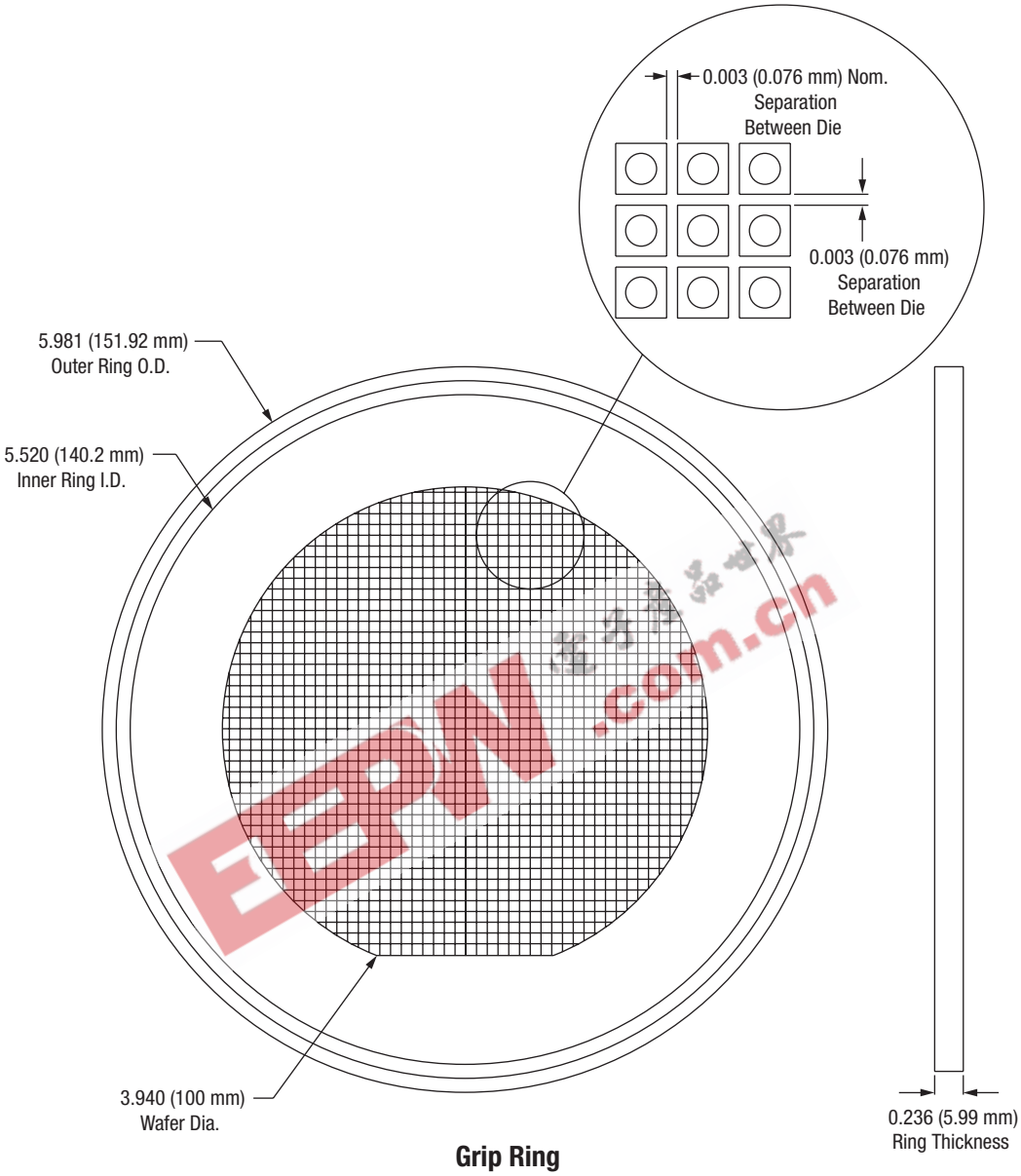


Series Resistance vs. Current @ 100 MHz



Capacitance vs. Reverse Voltage

Wafer On Film



Grip Ring

Wafer Film Frame Description

- Wafer on nitto tape
- Color: light blue
- Thickness: 2.2–3 mils
- Tensile strength: 6.6 (lbs. in width)
- Ring material: plastic